

What is claimed is:

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1. A plant growth affecting composition comprising an IAA derivative selected from a group consisting of mono-substituted IAA derivatives, di-substituted IAA derivatives, multi-substituted IAA derivatives and mixtures thereof and further comprising at least one additional plant growth regulator.

2. The composition according to claim 1, comprising a mono-substituted IAA derivative.

10 3. The composition according to claim 1, comprising 5-Br-IAA.

4. The composition according to claim 3, comprising one or more compounds selected from a group consisting of 2,4-D, BAP, ABA, zeatin riboside, kinetin, 2iP and dicamba.

15 5. A plant growth affecting composition formed by mixing an IAA derivative selected from a group consisting of mono-substituted IAA derivatives, di-substituted IAA derivatives, multi-substituted IAA derivatives and mixtures thereof with at least one additional plant growth regulator.

20 6. The composition according to claim 5, formed by mixing a mono-substituted IAA derivative with at least one additional plant growth regulator.

7. The composition according to claim 5, formed by mixing 5-Br-IAA with at least one additional plant growth regulator.

25 8. The composition according to claim 7, formed by mixing 5-Br-IAA with at least one compound selected from a group consisting of 2,4-D, BAP, ABA, zeatin riboside, kinetin, 2iP and dicamba.

30 9. A medium for culturing plant samples, comprising an IAA derivative selected from a group consisting of mono-substituted IAA derivatives, di-substituted IAA derivatives, multi-

substituted IAA derivatives and mixtures thereof and further comprising at least one additional plant growth regulator.

5 10. The medium according to claim 9, comprising a mono-substituted IAA derivative and at least one additional plant growth regulator.

11. The medium according to claim 9, comprising 5-Br-IAA and at least one additional plant growth regulator.

10 12. The medium according to claim 9, comprising 5-Br-IAA and one or more compounds selected from a group consisting of 2,4-D, BAP, ABA, zeatin riboside, kinetin, 2iP and dicamba.

13. A method of affecting plant growth, comprising:

15 applying to a plant sample and effective amount of a plant growth affecting composition comprising an IAA derivative selected from a group consisting of mono-substituted IAA derivatives, di-substituted IAA derivatives, multi-substituted IAA derivatives and mixtures thereof and further comprising at least one additional plant growth regulator.

20 14. The method according to claim 13, wherein the plant growth affecting composition comprises a mono-substituted IAA derivative.

15. The method according to claim 13, wherein the plant growth affecting composition comprises 5-Br-IAA.

25 16. The method according to claim 15, further comprising one or more compounds selected from a group consisting of 2,4-D, BAP, ABA, zeatin riboside, kinetin, 2iP and dicamba.

17. A method of regenerating a plant sample, comprising the steps of:

contacting a plant sample with a medium under conditions causing the regeneration of the plant sample, wherein the medium comprises an IAA derivative selected from a group consisting of mono-substituted IAA derivatives, di-substituted IAA derivatives, multi-substituted IAA derivatives and mixtures thereof and further comprises one or more additional plant growth regulators.

18. The method according to claim 17, wherein the medium comprises a mono-substituted IAA derivative.

19. The method according to claim 17, wherein the medium comprises 5-Br-IAA.

20. The method according to claim 19, wherein the medium further comprises one or more compounds selected from a group consisting of 2,4-D, BAP, ABA, zeatin riboside, kinetin, 2iP and dicamba.

21. A method of regenerating a plant sample, comprising the steps of:

culturing a sample in contact with a callus formation medium under conditions causing the formation of a callus, a callus formation medium comprising an IAA derivative selected from a group consisting of mono-substituted IAA derivatives, di-substituted IAA derivatives, multi-substituted IAA derivatives and mixtures thereof and further comprising one or more additional plant growth regulators;

transferring the callus to a medium under conditions causing the regeneration of the plant sample.

22. A method according to claim 21, wherein the callus formation medium comprises a mono-substituted IAA derivative.

23. A method according to claim 21, wherein the callus formation medium comprises 5-Br-IAA.

24. A method according to claim 23, wherein the callus formation medium comprises one or more compounds selected from a group consisting of 2,4-D, BAP, ABA, zeatin riboside, kinetin, 2iP and dicamba.

5 25. A method for the production of an embryogenic callus from a plant sample, comprising the steps of:

contacting a plant sample with a composition comprising an IAA derivative selected from a group consisting of mono-substituted IAA derivatives, di- substituted (AAA) derivatives, multi-substituted IAA derivatives and mixtures thereof and further comprising
10 one or more additional plant growth regulators under conditions causing the production of an embryogenic callus.

26. The method according to claim 25, wherein the composition comprises a mono-substituted IAA derivative.

15 27. The method according to claim 25 wherein the composition comprises 5-Br-IAA.

28. The method according to claim 27, wherein the composition comprises one or more compounds selected from a group consisting of 2,4-D, BAP, ABA, zeatin riboside, kinetin,
20 2iP and dicamba.

29. A method for the production of an embryogenic callus from a plant sample, comprising the steps of:

incubating a plant sample at a reduced temperature;

25 contacting the plant sample with a composition comprising an IAA derivative selected from a group consisting of mono-substituted IAA derivatives, di- substituted IAA derivatives, multi-substituted IAA derivatives and mixtures thereof and further comprising one or more additional plant growth regulators under conditions causing the production of an embryogenic callus.

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30. The method according to claim 29, wherein the composition comprises a mono-substituted IAA derivative.

31. The method according to claim 29, wherein the composition comprises 5-Br-IAA.

32. The method according to claim 31, wherein the composition comprises one or more compounds selected from a group consisting of 2,4-D, BAP, ABA, zeatin riboside, kinetin, 2iP and dicamba.

33. The method according to claim 29, wherein the reduced temperature is a temperature from about 0° C. to about 10 ° C.

34. The method according to claim 29, wherein the reduced temperature is about four ° C.

35. A method of regenerating a shoot from a callus, comprising the steps of:
contacting a callus with a regeneration medium, the regeneration medium comprising an IAA derivative selected from a group consisting of mono-substituted IAA derivatives, di-substituted IAA derivatives, multi-substituted IAA derivatives, and mixtures thereof and further comprising one or more additional plant growth regulators; and
incubating the callus under conditions causing the regeneration of a shoot from the callus.

36. The method according to claim 35, wherein the regeneration medium comprises a mono-substituted IAA derivative.

37. The method according to claim 35, wherein the regeneration medium comprises 5-Br-IAA.

38. The method according to claim 37, wherein the regeneration medium comprises one or more compounds selected from a group consisting of 2,4-D, BAP, ABA, zeatin riboside, kinetin, 2iP and dicamba.

39. A method of regenerating a transformed plant sample, comprising the steps of:
culturing a plant sample in the presence of the callus formation medium under
conditions causing the formation of an embryogenic callus, wherein the callus formation
medium comprises an IAA derivative selected from a group consisting of mono-substituted
IAA derivatives, di- substituted IAA derivatives, multi-substituted IAA derivatives and
mixtures thereof and further comprises one or more additional plant growth regulators;
transforming the embryogenic callus; and
incubating the transformed callus under conditions causing the regeneration of the
plant sample.

40. The method according to claim 39, wherein the callus formation medium comprises a
mono-substituted IAA derivative.

41. The method according to claim 39, wherein the callus formation medium comprises 5-
Br-IAA.

42. The method according to claim 41, wherein the callus formation medium comprises
one or more compounds selected from a group consisting of 2,4-D, BAP, ABA, zeatin
riboside, kinetin, 2iP and dicamba.

43. The method according to claim 39, further comprising the step of incubating the plant
sample at a reduced temperature.

44. A method for the regeneration of a transformed plant sample, comprising the steps of:
transforming a plant sample;
contacting the transformed plant sample with a regeneration medium under conditions
causing the regeneration of the plant sample, wherein the regeneration medium comprises an
IAA derivative selected from a group consisting of mono-substituted IAA derivatives, di-
substituted IAA derivatives, multi-substituted IAA derivatives and mixtures thereof and
further comprises one or more additional plant growth regulators.

45. The method according to claim 44, wherein the regeneration medium comprises a mono-substituted IAA derivative.

5 46. The method according to claim 44, wherein the regeneration medium comprises 5-Br-IAA.

47. The method according to claim 46, wherein the regeneration medium comprises one or more compounds selected from a group consisting of 2,4-D, BAP, ABA, zeatin riboside,
10 kinetin, 2iP and dicamba.

48. The method according to claim 44, further comprising the steps of:
culturing the transformed plant sample in a callus formation medium under conditions causing the generation of a transformed callus; and
15 transferring the transformed callus to a regeneration medium under conditions causing the regeneration of the transformed callus.

49. The method according to claim 48, further comprising the step of amplifying the callus.

50. The method according to any one of claims 13, 17, 21, 25, 29, 35, 39, or 44, wherein the plant sample is derived from a mature plant selected from a group consisting of maize, wheat, sorghum, sugar beets, potatoes, soy beans and rice.

25 51. The method according to claim 50, wherein the plant sample is derived from a maize variety selected from a group consisting of B73, H99 and PA91.

52. A kit for the production of an embryogenic callus from a plant sample comprising:
at least one container; and
30 a callus formation medium, wherein the callus formation medium comprises an IAA derivative selected from a group consisting of mono-substituted IAA derivatives, di-

substituted IAA derivatives, multi-substituted IAA derivatives and mixtures thereof and further comprises one or more additional plant growth regulators.

53. The kit according to claim 52, comprising at least one container adapted for
5 membrane-based liquid cell culture.

54. A kit for the regeneration of a plant sample, comprising:
at least one container; and

10 a regeneration medium, wherein the regeneration medium comprises an IAA
derivative selected from a group consisting of mono-substituted IAA derivatives, di-
substituted IAA derivatives, multi-substituted IAA derivatives, and mixtures thereof and
further comprises one or more additional plant growth regulators.

15 55. The kit according to claim 54, comprising at least one container adapted for
membrane-based liquid cell culture.

56. The kit according to claim 55, further comprising a callus formation medium.

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